

How DNA Testing Connected One Woman's Ancestry to the First Farmers of Ancient Germany

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What Is Mitochondrial DNA and Why Does It Matter?

Every person alive today carries two kinds of DNA. The kind most people are familiar with comes from both parents and shuffles itself with every new generation, making it difficult to trace back more than a few hundred years. But there is a second kind — mitochondrial DNA, or mtDNA — that works very differently. Mitochondrial DNA is passed from a mother to all her children, completely unchanged, generation after generation. Your mtDNA is identical to your mother's, which was identical to her mother's, and so on back through time in an unbroken chain of women stretching thousands of years into the past.

Because mtDNA changes so slowly and so rarely, scientists can use it to compare living people with ancient human remains recovered from archaeological sites. When a match is found between a living person's mtDNA and an ancient skeleton, it means those two individuals share a common maternal ancestor — the same woman somewhere back in time whose DNA has survived in both lines down to the present day.

This is the story of one such connection.

The Starting Point: A Woman Born in 1845

The earliest maternal line ancestor we can document in this family lived in Hitzacker, a small town on the Elbe River in Lower Saxony, Germany. She was born around 1845. Beyond that, the paper trail runs out — no earlier records have yet been found to tell us where her maternal ancestors came from before her.

But DNA tells a different story entirely.

The Haplogroup: What Kind of mtDNA Is This?

When mtDNA is tested through FamilyTreeDNA's full sequence test, the result is a haplogroup assignment — essentially a family group name that tells you which branch of the global maternal family tree you belong to. Think of it like a surname for your maternal line that goes back not hundreds but thousands of years.

This maternal line belongs to haplogroup **H1au2a**. To understand what that means, picture a tree. The trunk is the oldest common maternal ancestor of all humans. The major branches represent the great migrations out of Africa tens of thousands of years ago. Haplogroup H is one of the largest branches in Europe today — about 40% of all European women carry it. H1 is a smaller branch within H, and H1au2a is a very specific twig near the end — rare enough that only 229 customers in the entire FamilyTreeDNA database share this close a connection to the ancient individuals described below.

The specific mutations that define this haplogroup — the tiny spelling differences in the DNA code that distinguish H1au2a from all other haplogroups — were confirmed by the full sequence test and are consistent with what scientists have found in ancient German burial sites dating back more than 7,000 years.

The First Farmers of Germany: The LBK Culture

To understand the ancient connections, we need to go back to approximately 5500 BCE — more than 7,500 years ago — when something extraordinary was happening in Europe. For tens of thousands of years, the people of Europe had lived as hunter-gatherers, following game and harvesting wild plants. Then, spreading westward from what is now Turkey and the Middle East, a new way of life arrived: farming.

These early farmers built permanent villages, raised cattle and pigs, grew wheat and barley, and made distinctive pottery decorated with incised lines and geometric patterns. Archaeologists named them the **Linearbandkeramik** — or LBK — after the style of their pottery. In plain English: the Linear Pottery Culture. They spread rapidly along the great river valleys of central Europe, including the Elbe, the Rhine, and the Danube. Mitochondrial DNA recovered from their burial sites shows that they brought specific maternal lineages with them from the Near East — and haplogroup H1 was among those lineages.

The Elbe River, along which Hitzacker sits today, was one of the main highways of this Neolithic expansion.

The Karsdorf Connection: A Relative from 5,200 BCE

Among all the ancient individuals whose DNA has been compared to this maternal line, one stands out above all others.

Karsdorf 6 was a man buried approximately 7,200 years ago — between 5207 and 5041 BCE — in a farming village called Karsdorf, located on the river Unstrut in Saxony-Anhalt, Germany. He was buried in a pit associated with one of his village's longhouses, as was the custom of LBK communities. His village sat on rich farmland in the Elbe drainage basin, approximately 200 kilometers south of where Hitzacker stands today — on the same river system.

When scientists extracted and sequenced his mitochondrial DNA, they found he belonged to haplogroup **H1au1b** — a sister branch to this family line's H1au2a. To put that in plain terms: Karsdorf 6 and the Hitzacker ancestor did not share the same mtDNA, but they shared a common maternal ancestor just one branch up the family tree. They were, in a sense, distant maternal cousins separated by thousands of years — two descendants of the same ancient woman, each carrying a slightly different version of her DNA.

That common ancestral woman lived sometime between approximately 4,600 and 10,500 years ago, most likely in central Europe. Her descendants split into at least two lines — one leading eventually to Karsdorf 6, another continuing forward through the centuries toward Lower Saxony and ultimately to the woman born in Hitzacker in 1845.

The Medieval Bridge: A Connection in Lower Saxony

The ancient DNA story does not jump straight from 5,200 BCE to 1845 CE. There is an important bridge in between.

Among the ancient connections is **Dunum 10**, a man who lived between 600 and 1000 CE — the early medieval period — in Dunum, a village in Ostfriesland, Lower Saxony, Germany. Ostfriesland is roughly 200 kilometers northwest of Hitzacker, within the same province.

Dunum 10 carried the same general H1au maternal lineage. His existence in the ancient DNA record tells us something important: the maternal line that arrived in Germany with the LBK farmers thousands of years earlier was still present in Lower Saxony during the medieval period, more than a thousand years before the Hitzacker ancestor was born. The lineage did not die out, did not migrate away, and did not disappear from the region. It was still there — in the same landscape, along the same coastal lowlands of northern Germany — through the Middle Ages and presumably onward to the 19th century.

The Iron Age: How Far Did This Line Spread?

Two other ancient individuals share a connection to this maternal line from the Iron Age period — roughly 400 to 50 BCE.

Fin Cop 20630 was found in Derbyshire, England, and **Gurgy 126** was found in Yonne, France, associated with the La Tène Celtic culture. Both share a common maternal ancestor with this line dating to approximately 4,650 BCE. This tells us that a branch of the H1au lineage had spread westward from central Europe into Britain and France by the Iron Age — carried by the population movements associated with Celtic cultures during the first millennium BCE.

These individuals are not direct ancestors of the Hitzacker line. They represent a cousin branch that went west while another branch stayed in northern Germany. Together they show just how far this ancient maternal lineage had traveled across Europe by the time Julius Caesar was alive.

Putting It All Together

Here is the story this DNA tells, from oldest to most recent:

Sometime between 5,500 and 5,000 BCE, a woman carrying the H1au maternal lineage was living in the Elbe basin of what is now Germany, among the first farming communities of central Europe. Her descendants split over the generations into multiple lines — one of which was buried at Karsdorf around 5,200 BCE, another of which continued northward through the centuries. By 600–1000 CE, descendants of this line were living in Lower Saxony. By 1845, one of those descendants — Wilhelmina Maria Elizabeth Keibel — was born in Hitzacker on the Elbe, in the very same river valley where the story began 7,000 years earlier.

The paper genealogy ends with her 1845 for now. The DNA reaches back to the Neolithic. Between them, they trace a single maternal line from the first farmers of Germany to the present day — along the same river, in the same landscape, across more than seven millennia.

What Comes Next

One important question remains open. Among the specific DNA mutations carried by this maternal line is a variant at position 16247 in the control region of the mitochondrial genome. If the Karsdorf 6 ancient sequence — which is archived in a scientific database

called AmtDB — also carries this same variant, it would mean the connection between this living line and that 7,200-year-old farmer is even closer than the haplogroup relationship alone suggests. Confirming this requires accessing the raw sequence data from the original scientific study.

If confirmed, it would represent a remarkably precise thread of maternal ancestry — a specific DNA signature shared between a Neolithic farmer buried on the river Unstrut and a woman born nineteen centuries later on the river Elbe, 200 kilometers downstream.